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well selected, but are intermixed with the work on anatomy to which they are related.

Some chapters and sections will doubtless prove very puzzling to beginners, especially those which treat of such difficult subjects as alternation of generations, heterospory, and the fertilization of the egg in angiosperms. The extreme condensation and briefness of treatment will almost defeat the purpose of the author, and we fear will cause these subjects, which ought to be made plain, to be looked upon still as beyond the reach of elementary students. The book is notable for its excellent diagrams, and on the whole is likely to prove its value by use.

Mr. E. F. Andrews,³ of the Washington, Ga., high school, calls his book *Botany all the year round*, in itself a taking title. In the body of the book he provides ample work to occupy the students through the winter as well as the summer. Each section is preceded by a list of material needed for its study. In connection with the reading matter directions are given for the use of this material, and at the close of the section the student is confronted with a number of "practical questions." The material for study consists chiefly of the flowering plants, only one chapter (of less than forty pages) being devoted to seedless plants and one (of thirteen pages) to ecology. The rest of the book is chiefly concerned with morphology and physiology, the former strongly tinged with the formal morphology of the older school, while the latter is not always accurate, and occasionally distinctly bad. In this part also one finds a good deal of ecology, and the student will likely be confused as to the scope of ecology by the existence of a separate chapter with this label. The practical questions are mostly well calculated to set the student to thinking, but too often they are impossible for him to answer with the data at hand. This tempts him to guess and reason *a priori*, which is directly contrary to the training sought by science work. Not infrequently the author suggests an answer by referring the student to some preceding paragraph, and so cases could easily be cited to show that the asker could not answer his own questions rightly. The book gives one the impression that the author has some familiarity with modern botany, but that he has not yet thoroughly assimilated the facts which he knows. Though the book has much to commend it, it cannot compare in real value with Stevens's and several others which could be named.—C. R. B.

MINOR NOTICES.

MR. A. S. HITCHCOCK,⁴ assistant agrostologist of the U. S. Department of Agriculture, has published a monograph of the ten North American species of the genus *Leptochloa*. No new species are described, and some forms

³ANDREWS, E. F., *Botany all the year round*, pp. 302, *figs.* 543. New York: American Book Company. 1903.

⁴HITCHCOCK, A. S., *North American Species of Leptochloa*. U. S. Dept. of Agric., Bureau of Plant Industry. Bull. 33. pp. 24. *pls.* 61. 1903.

kept separate by other authors have been united on the principle that when such forms are connected by numerous intergrading specimens they are to be considered as the same species, although typical specimens of the extreme forms may be easily distinguished.—C. R. B.

A CRITICAL REVISION of the genus *Eucalyptus* has been undertaken by Mr. J. H. Maiden,⁵ the government botanist of New South Wales and director of the Botanic Gardens, Sydney. Part I of this publication has just appeared, containing in the preface a discussion of the variations in the genus, and a list of doubtful species referred to it and such species excluded from the genus, and a bibliography. The remainder of the part is devoted to a description of *Eucalyptus pilularis*: its synonymy, range, and affinities. Of the four plates two are given to the typical form of the species, another to the variety *Muelleriana*, and one to the illustration of fruits showing variation in the species.

NOTES FOR STUDENTS.

PROFESSOR BOWER⁶ has announced the discovery of a sporophyll of *Lycopodium rigidum* bearing two sporangia side by side. The great rarity of this phenomenon emphasizes the remarkable constancy of the solitary sporangium among the true Lycopodiales.—J. M. C.

MOLISCH contends⁷ that the buoyancy of the Cyanophyceae of the plankton does not depend upon gas vacuoles, and that the bodies which were so interpreted by von Strodtnann and Klebahn cannot possibly be gaseous. He was not able to determine whether they were fluid or solid, but inclines to the belief that they are viscous.—C. R. B.

HOLM⁸ has used a study of *Carex fusca* and *Carex bipartita* as an occasion for severely criticising what he calls "type-species botany." He shows that the superficial determination of herbarium specimens reputed to be the type material of the older taxonomists may be very far from reaching reliable results. He says that such research should include a good deal more, such as a large amount of literary research, a study of the author's method of describing and of citing, the history of the herbarium since it left his hands, etc.—J. M. C.

⁵ MAIDEN, J. H., A critical revision of the genus *Eucalyptus*. pp. 47. pls. 4. Published by Authority of the Government of the state of New South Wales. Sydney: W. A. Gullick. 1903. 2 shillings sixpence.

⁶ BOWER, F. O., Note on abnormal plurality of sporangia in *Lycopodium rigidum* Gmel. Ann. Botany 17: 278-280. 1903.

⁷ MOLISCH, HANS, Die sogenannten Gasvacuolen und das Schweben gewissen Phycocchromaceen. Bot. Zeit. 61: 47-58. figs. 4. 16 Mar. 1903.

⁸ HOLM, THEO., Studies in the Cyperaceae. XVIII. On *Carex fusca* and *Carex bipartita* All. Am. Jour. Sci. 15: 145-152. 1903.